

REMARKS

I. Status of the Claims and the Rejections

Claims 1-2, 4 and 6-12 were rejected for alleged obviousness under 35 U.S.C. § 103 based on Warner U.S. Patent No. 4,445,342 ("Warner") in view of Zimmer et al U.S. Patent No. 4,013,118 ("Zimmer"). Claim 3 was rejected for alleged obviousness under 35 U.S.C. § 103 based on Warner in view of Zimmer and Fischer et al U.S. Patent No. 5,545,084 ("Fischer"). Claim 5 was rejected for alleged obviousness under 35 U.S.C. § 103 based on Warner in view of Zimmer and Buchholz et al U.S. Patent Application Publication No. 2001/0032472 ("Buchholz"). Applicants respectfully traverse these rejections.

However, applicants have amended independent claim 9 to further clarify the subject matter regarded as patentable. Applicants have also amended claims 2 and 12 and added claim 13 in this response. These amendments are fully supported by the original specification. In view of these amendments and the following remarks, applicants respectfully request reconsideration and allowance.

II. Claims 1-12 are Not Obvious

A. The Claims

Independent claim 1 recites a device for regulating the temperature of individual sections of the interior of an aircraft, the device including a distribution line connected to a supply of pre-tempered mixed air flowing from a mixer valve, and also connected with the individual sections by respective supply lines. The pre-tempered mixed air is at a lowest nominal temperature assigned to any of the individual sections. The device further includes "individual heating units assigned to respective individual sections and adapted to heat the pre-tempered mixed air flowing in the respective supply lines." The device also includes sensors,

transmitters, and a regulator unit for controlling the mixer valve and the individual heating units. Each of claims 2-8 and 12 depends from independent claim 1 and recites additional features, such as "the heating units are disposed in the supply lines and are positioned adjacent to entrances to the respective individual sections" in claim 2.

Independent claim 9 is directed to a process for regulating the temperature of individual sections of the interior of an aircraft. The process includes identifying respective actual and nominal temperatures of the individual sections, mixing engine bleed air and air which is cooler than the engine bleed air to obtain pre-tempered mixed air at a temperature equal to the lowest nominal temperature, and distributing the pre-tempered mixed air to all of the individual sections. The process also includes "post-tempering the mixed air distributed to the individual sections . . . by heating the mixed air with individual heating units." Claims 10 and 11 depend from independent claim 9 and recite additional features, such as setting the nominal temperatures of the individual sections manually as recited in claim 11.

B. The Deficiencies of the Cited Prior Art

Warner is directed to a turbine driven air cycle refrigeration system for cooling multiple zones of a transport aircraft. As shown in Figure 1 of Warner, the refrigeration system includes a control valve (140) which delivers hot bleed air from an engine into cooled exhaust air leaving a turbine (70). The mixed air then travels through a compressor (90) and line (105) into a pair of supply lines (110, 112) respectively connected to different compartments (115, 120). The system also includes a second supply line from the hot bleed air source including a pair of trim valves (180, 205) configured to deliver hot bleed air into the mixed air to independently control the input air temperature for each compartment. See col. 3, line 23 – col. 4, line 6.

Warner does not teach that the pre-tempered mixed air allegedly flowing from the control valve (140) is of a temperature that corresponds to the lowest nominal temperature of the

individual aircraft compartments. The Office Action turns to Zimmer, which is drawn to automatic control of heating and cooling of a building using a central heating and cooling system. Schematically shown in Figure 1, the system of Zimmer includes a hot deck (13) and a cold deck (14) which are supplied with hot and cold air from respective heat exchangers (21, 22). Each room or zone (10, 11, 12) in the building is separately connected to both the hot deck (13) and the cold deck (14) via trim valves or dampers (15, 16) that control the temperature of air input into the zones. The temperature of cold air in the cold deck (14) is controlled according to the greatest cooling demand in the building. Col. 3, lines 11-18.

The Office Action states that it would have been obvious to modify the alleged pre-tempered air flowing in Warner to have the lowest nominal temperature of the respective compartments, in view of the control of the cold deck in Zimmer. However, Warner is not properly combinable with Zimmer because Warner teaches away from the system of Zimmer. Warner, like the present application, specifically teaches that independent control of input temperature to multiple zones by separately mixing uncooled air with cooled air for each zone is undesirable because "Such independent control would require substantial duplication of system components (valves, controllers, actuators and the like) thereby adding substantially to the cost, weight, complexity and maintenance requirements of the system."

As observed above, Zimmer duplicates the distribution lines (hot deck and cold deck), supply lines, and trim valves (dampers) for each zone in the building. This is precisely the component duplication that Warner teaches away from. While the substantial cost, weight, and maintenance requirements of the Zimmer system may be acceptable for a central air system in a building, one of ordinary skill in the aircraft art such as Warner would not turn to such a system to modify an aircraft cooling system. An aircraft cooling system must minimize weight, space,

and maintenance requirements. The Office Action does not recite an objective reason for ignoring this aspect of Zimmer. Thus, the combination of Warner and Zimmer is improper.

Even if Warner and Zimmer could be properly combined, the resulting system would still be deficient. Independent claims 1 and 9 recite "individual heating units" assigned to the respective individual sections for heating the pre-tempered mixed air flowing in the respective supply lines. Based on the specification, these individual heating units are decentralized heating units (such as electrical heating elements, in one embodiment) because hot bleed air is provided only to the mixer valve in order to minimize the number of bleed air mix valves and bleed air lines in the aircraft. See paragraphs [0011]-[0014] and [0039]. In other words, the individual heating units cannot be separate mixer or trim valves delivering hot bleed air to the respective supply lines.

The Office Action states that the trim valves (180, 205) of Warner are the claimed "individual heating units." This is clearly incorrect. The individual heating units of claims 1 and 9 cannot be reasonably interpreted to include such trim valves and separate hot bleed air lines. Also, Zimmer does not provide individual heating units, so the combination fails to disclose each element of independent claims 1 and 9.

For at least these reasons, independent claims 1 and 9 are allowable over Warner and Zimmer. Applicants respectfully request that the rejection of claims 1 and 9 be withdrawn.

Each of dependent claims 2-8 and 10-12 depends from one of independent claims 1 and 9, and recites one or more additional features in combination with the features of claim 1 or 9. For substantially the same reasons set forth with respect to each of claims 1 and 9, and further because Warner and Zimmer (alone or in combination with Fischer and/or Buchholz) do not teach the combination of elements recited in any of these claims, applicants respectfully request that the rejection of claims 2-8 and 10-12 be withdrawn.

With respect to dependent claim 2, Warner and Zimmer are clearly deficient for an additional reason. Claim 2 recites that the heating units are disposed in the supply lines. The trim valves (180, 205) of Warner are clearly not disposed "in" the respective supply lines (110, 112). Again, Zimmer does not disclose any individual heating units in any location, let alone in a supply line. For at least this additional reason, claim 2 is allowable over Warner and Zimmer, and applicants request that the rejection of claim 2 be withdrawn.

III. New Claim 13 is Allowable

New claim 13 depends from independent claim 9 and further recites that "the pre-tempered mixed air is distributed to all of the individual sections by a distribution line connected with the individual sections by respective supply lines, the individual heating units being disposed in the respective supply lines." Similar to dependent claim 2, claim 13 clearly requires that the individual heating units be "in" the supply lines. As described above, neither Warner nor Zimmer disclose any heating units disposed in the supply lines, and thus are deficient with respect to claim 13. For at least this reason, as well as the reasons provided above with respect to independent claim 9, applicants respectfully request that claim 13 be allowed.

IV. Conclusion

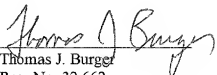
Based on the amendments to the claims and these remarks, applicants respectfully assert that all present claims are in condition for allowance, and respectfully request an allowance without further delay.

It is believed that no fee is due for this filing, other than the fee for a Request for Continued Examination. If any fee is deemed due, consider this as an authorization to charge Deposit Account 23-3000 therefore.

Respectfully submitted,

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Date


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